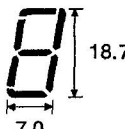


SHARP SERVICE MANUAL

CODE: 00ZEL2192G22E



EL-2195L MODEL EL-2192GII

STANDARD FUNCTION		12 digits	1+(GT)
DISPLAY SECTION	1'234'567'890.12 $\frac{M}{EG}$		
	ELEMENT: LCD		PARTS NAME: LD-B3699A
	NUMERAL: 12 digits	SYMBOL: 1 digit(s)	
	<div><p>18.7</p><p>7.0</p><p>(mm)</p></div> <div>$\frac{M}{EG}$</div>		

L S I	Name : TC83230-0203
	Type : FLT
	Pin : 80pins

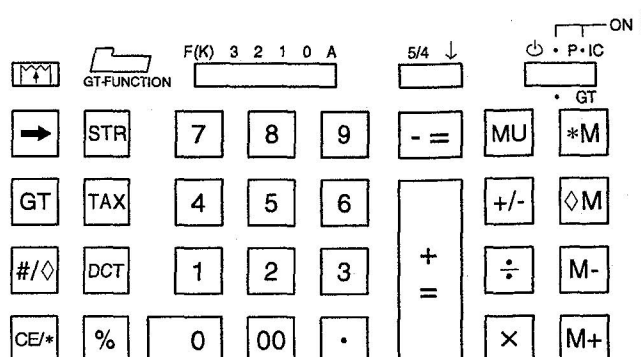
POWER SUPPLY	AC: <input type="radio"/>	DC: <input checked="" type="radio"/>
• BATTERY TYPE		
AC only		
• OPERATION TIME		

AC ADAPTOR	
RECHARGEABLE BATTERY	
POWER CONSUMPTION	42mA: AA7, AB7 7.7W, 75mA: YYC
AUTO POWER OFF TIME	minutes
MEMORY PROTECT	Yes*1 (TAX/DCT constant only)
DIMENSIONS(mm)	206(W) 257(D) 53(H)
CALCULATIONS	
Four arithmetic calculation, Constant calculation, Power calculation, Chain calculation, Reciprocal calculation, % calculation, Add-on (discount) calculation, Grand total calculation, etc.	
NOTE) *1: This calculator operates only on AC power. Further, the memory is retained only while the AC cord is plugged in and clears when the AC cord is disconnected.	

PRINTER SECTION

MODEL NAME	PTMFL87(KI-OB1078CCZZ)
PRINTING SYSTEM	Serial print type
PRINTING CAPACITY	19 digits
CHARACTER DIMENSION	1.6(W) 3.5(H) mm
INPUT BUFFER	12 stages
PRINTING SPEED	Approx. 2.6 lines/sec.
PAPER FEED SPEED	Approx. 8.5 lines/sec.
PAPER RELEASE MECHANISM	Yes
INK RIBBON	
INK ROLLER (OPTION)	Black: EA-781R-BK, Red: EA-781R-RD
INK LIFE	200 thousand characters
PAPER	Plain paper
PAPER SIZE (Roll paper)	58 ^{±0} mm(W), 80mm in diameter (max.) DPAPR1004CSZZ ... 5 rolls/pack

KEY LAYOUT



KEY SYSTEM: PLASTIC Key Top + Rubber Spring

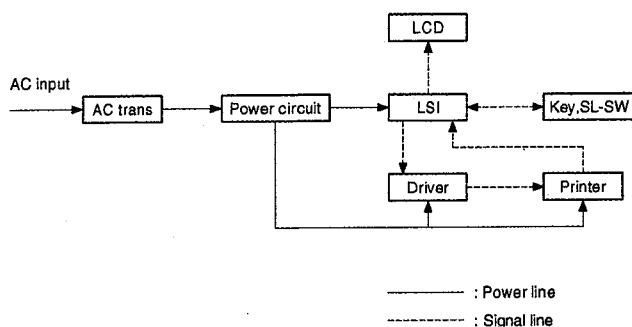
Parts marked with "△" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

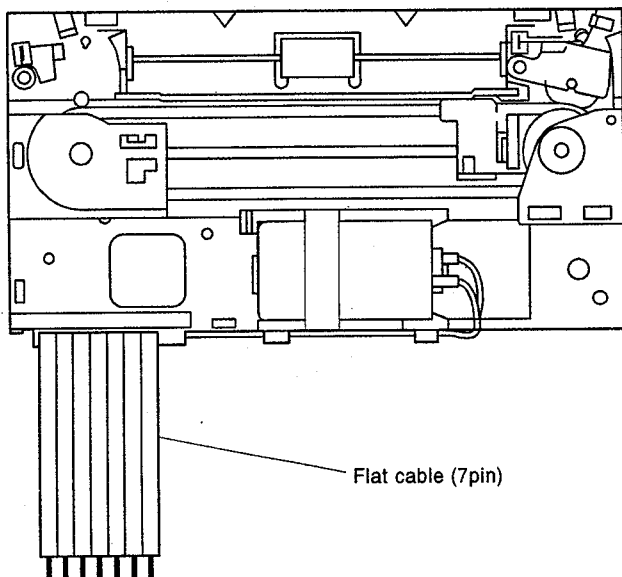
This document has been published to be used for after sales service only.
The contents are subject to change without notice.

KP

1. Block diagram



2. Printer repair



The printer unit for servicing is delivered with the flat cable attached to it as shown in the above figure.

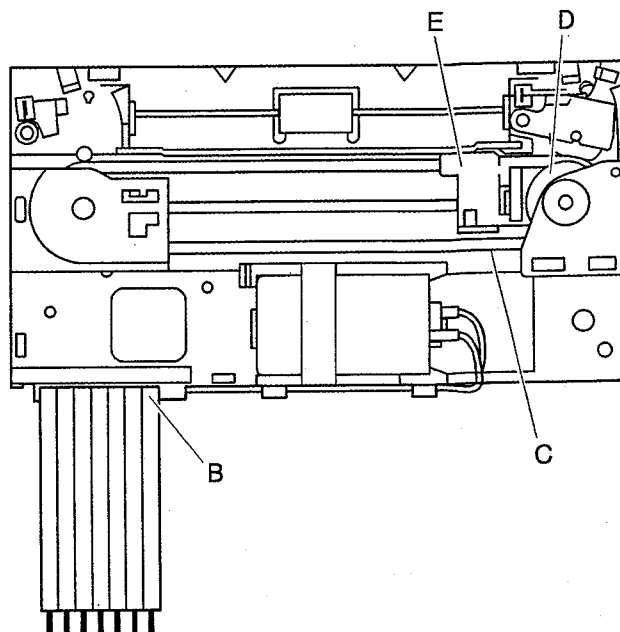
Since the EL-2195L mechanism differs from the conventional EL-2192G mechanism, the length of flat cable for connection between the printer unit and the PCB also differs. (The EL-2195L cable is longer.)

When, therefore, replacing the printer unit, remove the original flat cable, attach the EL-2195L flat cable (part code: 0EENB072540042), then replace the printer unit.

3-2. Cautions in Handling

(1) How to Hold

1) Basically the printer should be held as shown by the arrows.



(2) Portions on which Force Must Not Be Imposed

- 1) Repeated force must never be given to the soldered portion of the lead wire A. (It may be broken at the soldered place)
- 2) No force must be added to the soldered portion B of the electromagnetic clutch.
- 3) The character belt C must not be turned manually.
- 4) The pulley D must not be turned manually.
- 5) No force must be given to the hammer holder E.

(3) Portions Which Must Not Be Touched

- 1) Do not touch the shaft with bare hands.
- 2) Do not touch the character belt with bare hands.

3-3. Detecting Mechanism

The detector is of mechanical contact type and consists of the code plate to output the character position detection signal to correspond to each character on the character belt, sensor gear unit to output the standard position signal, and fixed contact-piece unit.

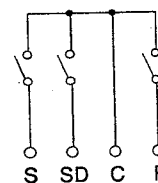
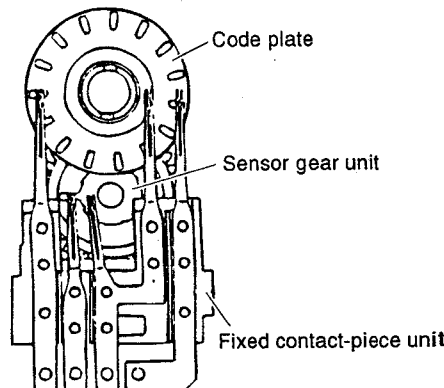


Fig. 1 Detecting Mechanism

Fig. 2 Equivalent Circuit

3. PTMFL87 PRINTER CAUTION NOTES

3-1. Servicing

The printer model PTMFL87 (Ki-OB1078CCZZ) used for the EL-2195L is available for service by an entire unit and therefore none of individual service parts is available for supply.

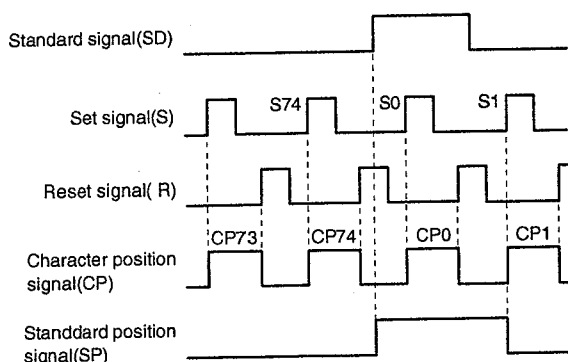


Fig. 3 Time Chart

The character position detecting signal (CP) is to be made by the user from the leading edges of the set signal and reset signal. This CP corresponds to the character on the character belt. The standard signal (SD) is a signal output once to the 75CP pulse, and the signal to be made by the user utilizing the leading edge of the second CP from the leading edge of this signal is the standard position signal (SP).

The reason why CP and SP are made using the raw signals output from the detector is that the effect of chattering is taken into consideration.

The following will explain the basic operation.

3-4. Operation Sequence

The basic operation is explained.

(1) Initialization

In order to make sure that the hammer holder is at its home position, i.e. the first column, print the space after power is turned on, and after the carry/return, do one-line paper feeding and set the hammer holder at its home position. This completes the initialization.

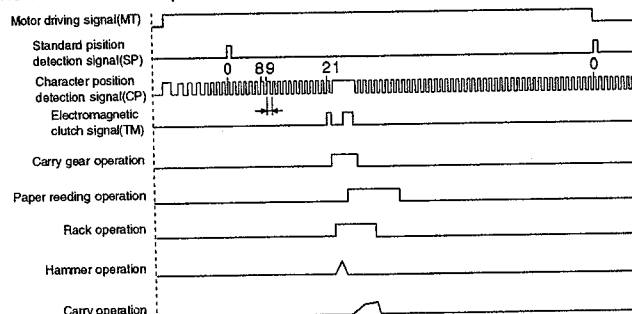


Fig. 4 Time Chart at Initialization

(2) 1-line printing operation

- 1) The printing operation is started by setting the motor driving signal (MT) ON.
- 2) Prior to 1-line printing, detect the standard position signal (SP) once and make the time from the leading edge of the character position detection signal CP8 to the leading edge of CP9 to and make it standard pulse width. (This to setting must be done at the initialization and prior to the 1-line printing. to is utilized for error detection.)
- 3) The character belt rotates until the desired CP pulse is detected.
- 4) If the desired CP pulse is detected, power is supplied to the electromagnetic clutch unit, the character belt is stopped, and printing operation/carry operation are done. In the meantime, the power to the electromagnetic unit is cut off. (For the detail, see 1.3.2. Printing/Carry Mechanism.)
- 5) After completion of the printing/carry operation, the character belt rotates again.

- 6) The operations 3) through 5) are repeated and 1-line printing is completed.
- 7) After the most significant digit printing, the electromagnetic clutch signal TM becomes OFF, and then between T3 and T4, paper feeding/column return operation is done by turning the electromagnetic clutch ON again.
 $T3 = 80 \text{ to } 200 \mu \text{ sec}$
 $T4 = (2.0 \sim 2.4) \times T_{CP}$
- 8) After paper feeding is started, it is completed when about 19CP is counted.
- 9) The motor driving signal is turned OFF after 19CP counting after the paper feeding is started. In case SP is not found within 19CP after the paper feeding is started, it is turned OFF after SP is detected.

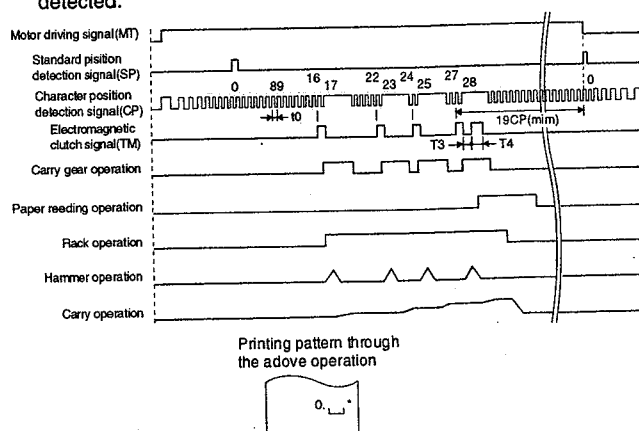


Fig. 5 Time Chart for 1-Line Printing (0. □ * printing)

(3) Continuous printing operation

- 1) After the 1-line printing operation in (2), the motor driving signal (MT) is not turned OFF and the operations 2) through 8) are continuously done for the necessary number of columns while the motor is run.
- 2) After the most significant digit of the last line is printed, the operations 7), 8) and 9) in (2) are done and the motor is stopped.

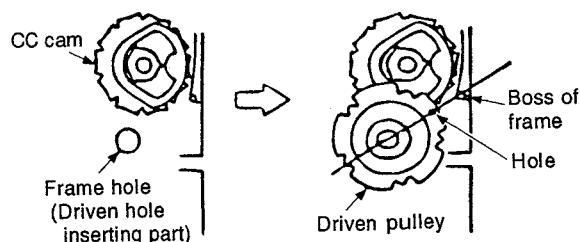
(4) Paper feeding operation

For the paper feeding operation, 1-line printing of space may be done in the same way as for the printing operation sequence.

3-5. Troubleshooting dislocated print belt

Install the character belt on the drive pulley and driven pulley. When installing the character belt, the following points must be considered.

- 1) If the driven pulley is removed and mismatched with the CC cam, it should be aligned as follows.

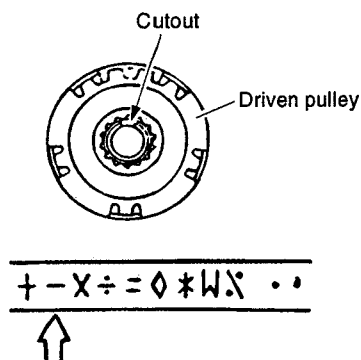


2) The character belt should be positioned as follows.

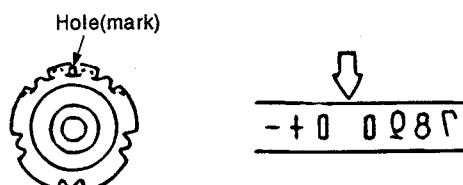
Manually turn the motor to the position where the SD pulse appears.

• A. Drive pulley side

Adjust the "-" of the character belt to the position of the hole (mark).
("-" shown in the above arrangement of characters)

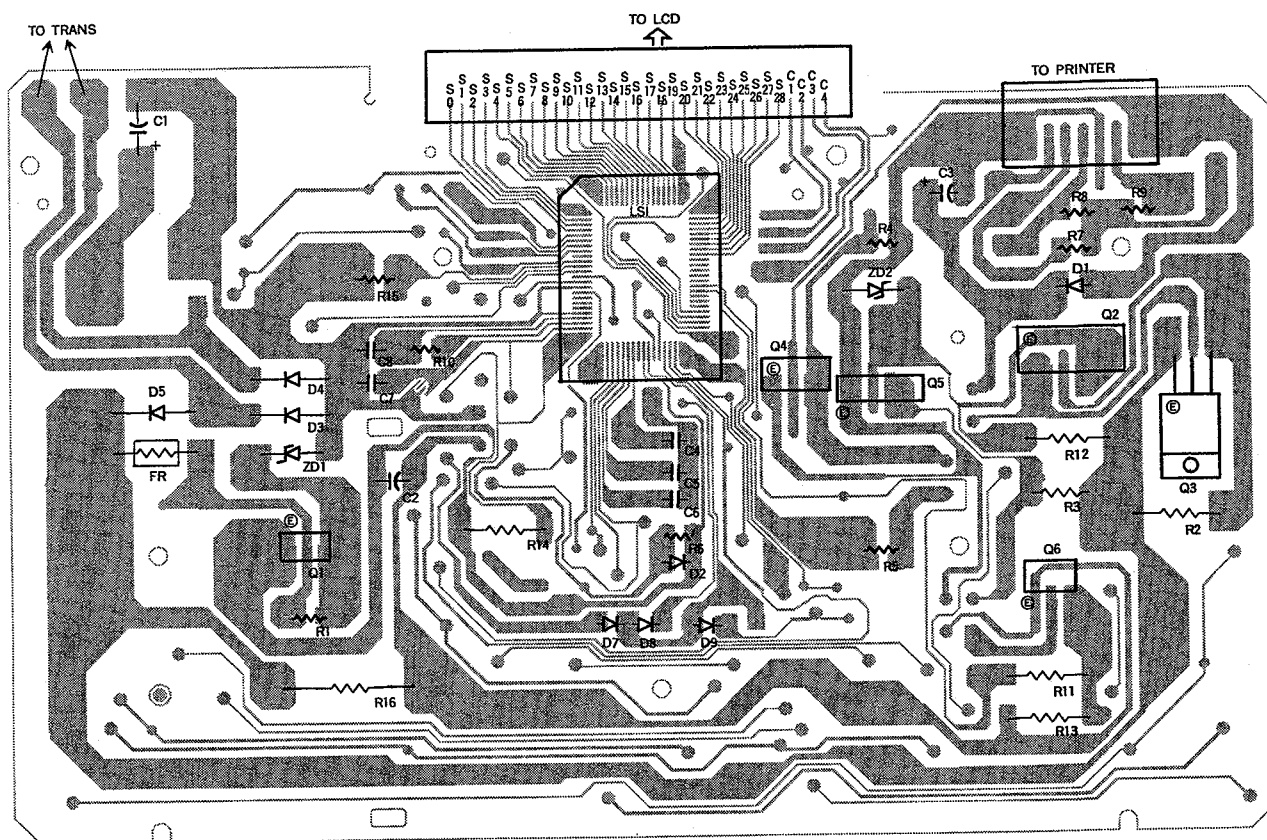


• B. Driven pulley side

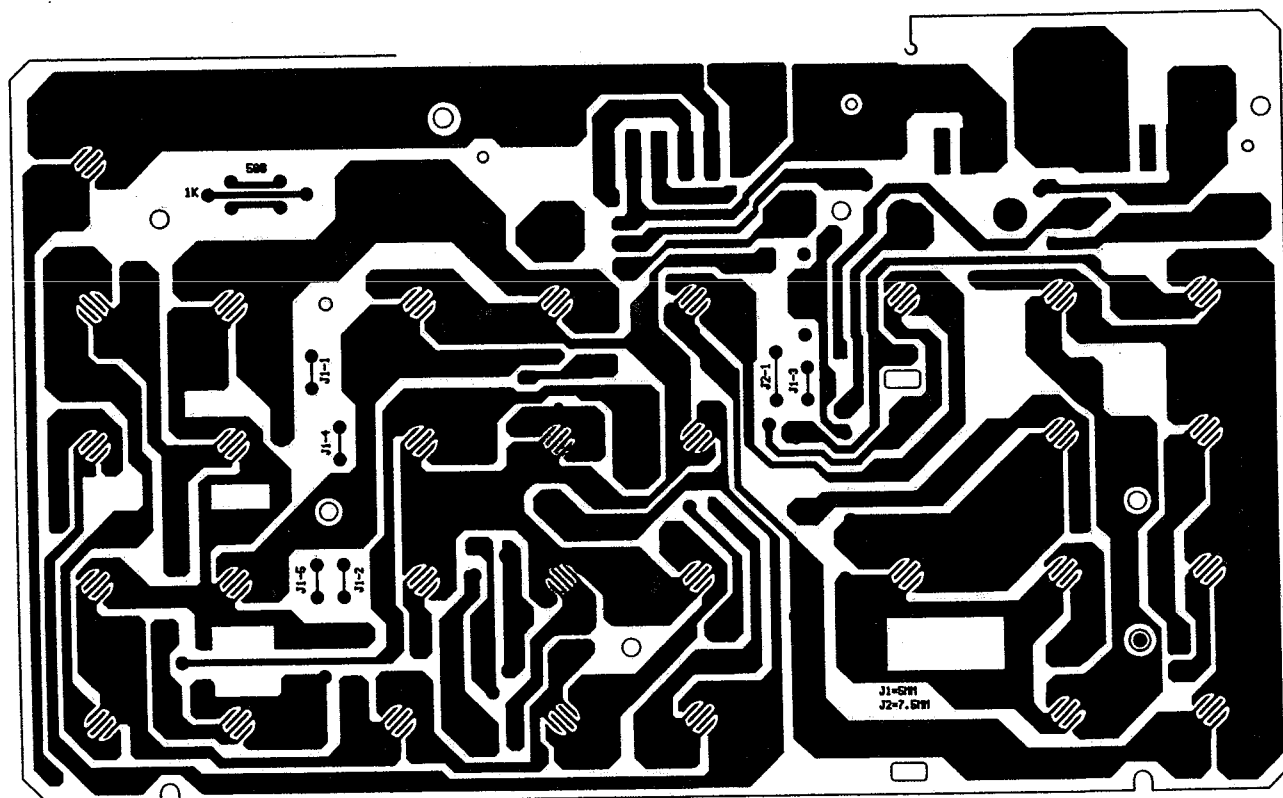


Adjust the center of the space of the character belt to the position of hole (mark).

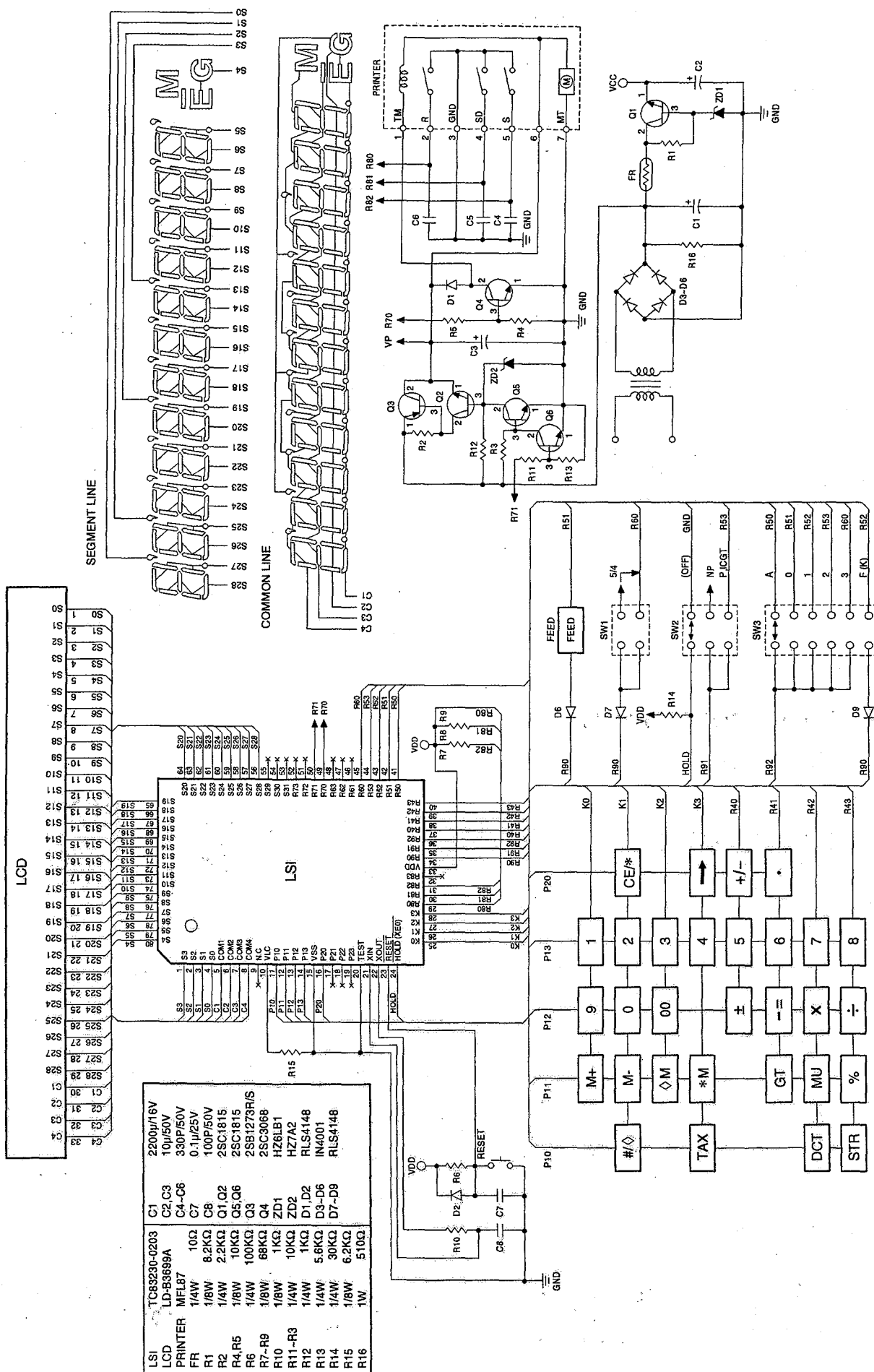
4-1. Parts signal arrangement (Parts installing surface)



4-2. Wiring pattern (Key side)



5. Circuit diagram



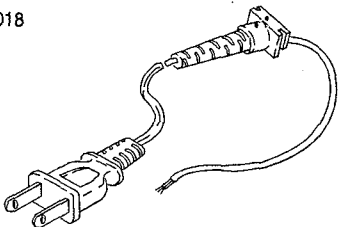
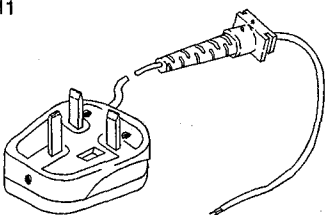
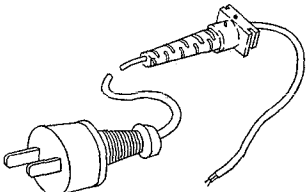
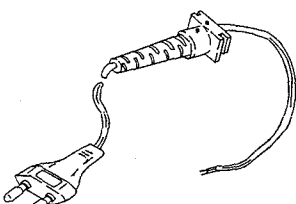
List of destinations (Destinations are determined by the name plate voltage and the plug shape.)

Destination	To identify destination		Major shipping country	Remarks
	Name plate voltage	Plug shape No.		
YYC	120V 60Hz	1	Canada	
AA7	220-230V 50Hz	2	U.Kingdom	
AB7	230-240V 50Hz	3	Austraria	
AC7	220-230V 50Hz	4	Germany	

AC cord

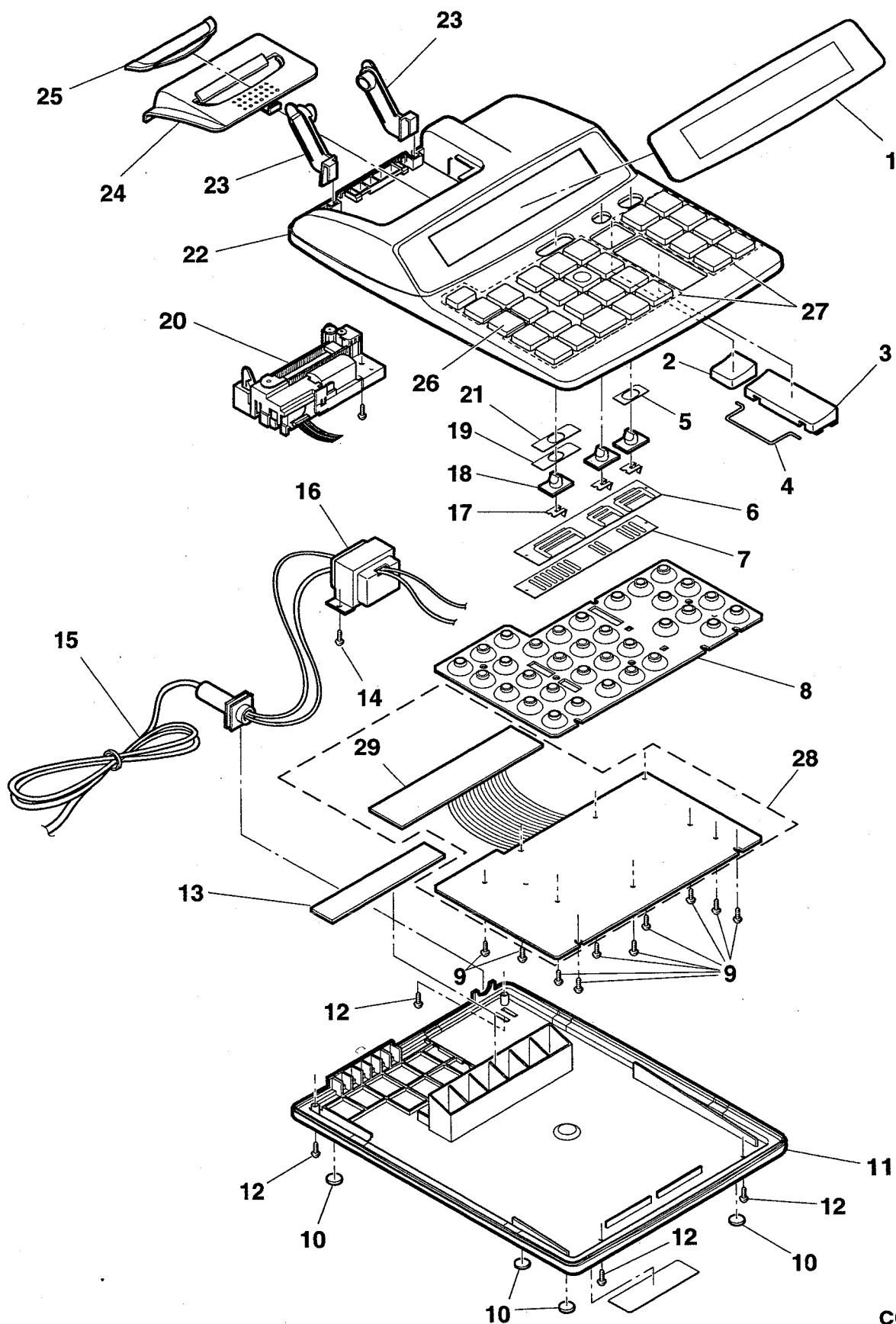
NO.	PARTS CODE	PRICE RANK	TYPE OF LEAD		DESCRIPTION	MODEL NAME	
			2 LEAD	3 LEAD		EL-2195L	EL-2192GII
1	0EEGA050010018	AS	F		AC cord YYC		○
2	0EEGA040020011	AZ	F		AC cord AA7	○	
3	0EEGA990000001	AT	F		AC cord AB7	○	
4	0EEGA020220014	AT	F		AC cord AC7		

Plug shape

<p>0EEGA050010018</p> <p>1</p>  <p>(YYC)</p>	<p>0EEGA040020011</p> <p>2</p>  <p>(AA7)</p>
<p>0EEGA990000001</p> <p>3</p>  <p>(AB7)</p>	<p>0EEGA020220014</p> <p>4</p>  <p>(AC7)</p>

Parts list & Guide

1 Exteriors



CCPS0071

3 PWB unit

[illegible]

1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	EL-2195L	EL-2192GII
1	0EEFD2PD051020	AP		D	Display window	○	
2	0EEFD2PD051011	AQ	N	D	Display window		○
3	0EEKB1PD056013	AD		C	Key top (-=)	○	○
3	0EEKB1PD055017	AD		C	Key top (+=)	○	○
4	0EELC030004508	AD		C	Balance steel (for +-key)	○	○
5	0EEL6PD053009	AC		C	SL-SW cover S	○	○
6	0EELDPD051008	AE		C	SW mylar	○	○
7	0EELDPD051016	AD		C	SW spacer	○	○
8	0EELAPD0510007	AN		C	Rubber sheet	○	○
9	XUPSN20P06000	AA		C	Screw (2 X 6)	(for PWB)	○
10	0EELC110001408	AC		D	Rubber foot	○	○
11	0EEFABPD051026	AT		D	Lower case	○	
11	0EEFABPD051018	AT		D	Lower case		○
12	XUPSN30P08000	AA		C	Screw (3 X 8)	(for cabinet)	○
13	0EEFH100028601	AD		C	Sponge cushion	○	○
14	XUPSD30P10000	AA		C	Screw (3 X 10)	(for transformer)	○
15	0EEGA990000001	AT		B	AC cord	[AB7]	○
15	0EEGA040020011	AZ	N	B	AC cord	[AA7]	○
15	0EEGA050010018	AS	N	B	AC cord	[YYC]	○
16	0EEDG140002018	BA		B	Transformer (230V)	○	
16	0EEDG140002000	BA	N	B	Transformer (120V)		○
17	0EEEF070PS1309	AC		C	SL-SW plate	○	○
18	0EEFB1PD051011	AC		C	SL-SW knob	○	○
19	0EEL6PD052002	AC		C	SL-SW cover M	○	○
20	Ki-OB1078CCZZ	BC		E	Printer unit (MFL87)	○	○
21	0EEL6PD051006	AC		C	SL-SW cover L	○	○
22	0EEFAAPD051020	AU		D	Upper case	○	
22	0EEFAAPD051038	AV	N	D	Upper case		○
23	0EEECPD0510209	AH		C	Paper holder unit (L/R pair)	○	○
24	0EEFAFPD051029	AE		D	Printer cover	○	
24	0EEFAFPD051011	AG		D	Printer cover		○
25	0EEFD2PD051003	AE		C	Paper cutter	○	○
26	0EEKB1PD053006	AE		C	Key top (GT)	○	○
27	0EEKGPD0510019	AQ		C	Key top(others)	○	○
28	0EEPD05XX0301R	BN		E	PWB unit(with LCD unit)	(include No.29)	○
29	0EEPD05XX3200T	BB		E	LCD unit(with H.M.F)	○	○

2 Packing material&Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	EL-2195L	EL-2192GII
1	0EEHE00PD05008	AK		D	Paper pad	○	○
2	0EEHK10PD05102	AE		D	Bubble bag	○	○
3	UBNDA1008CCZZ	AA		C	AC cord band	○	○
4	0EEHAHTPD05401	AR		D	Packing case	○	
4	0EEHAHTPD05304	AS	N	D	Packing case		○
5	0EEHDHTPD05700	AH		D	Instruction book (7Languages)	○	
5	0EEHDH2PD053T5	AE		D	Instruction book (3Languages)		○
6	0EEHGA00002309	AD	N	D	Important label-A	[AA7]	○
7	0EEHGG00017508	AD		D	Noise label		○
8	0EEHF6JT000419	AD	N	D	Warranty card		○

3 PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	EL-2195L	EL-2192GII
1	0EEAB832300002	BA		B	LSI (TC83230-0203)	[LSI]	○
2	RR-ZZ1003CCZZ	AB		B	Fuse resistor (1/4W 10Ω ±5%)	[FR]	○
3	VRS-TP2BD104J	AA		C	Resistor (1/8W 100KΩ ±5%)	[R6]	○
4	VRS-TP2BD683J	AB		C	Resistor (1/8W 68KΩ ±5%)	[R7-9]	○
5	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R4,5]	○
6	VRS-TP2BD822J	AA		C	Resistor (1/8W 8.2KΩ ±5%)	[R1]	○
7	VRS-TP2BD622J	AA		C	Resistor (1/8W 6.2KΩ ±5%)	[R15]	○
8	VRS-TP2BD102G	AB		C	Resistor (1/8W 1KΩ ±2%)	[R10]	○
9	VRD-HT2EY303J	AA		C	Resistor (1/4W 30KΩ ±5%)	[R14]	○
10	VRD-HT2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R11,3]	○
11	VRD-HT2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R13]	○
12	VRD-HT2EY222J	AA		C	Resistor (1/4W 2.2KΩ ±5%)	[R2]	○
13	VRD-HT2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R12]	○
14	0EECC5100411T9	AC		C	Resistor (1W 510Ω)	[R16]	○
15	VCEAGU1CW228M	AE		C	Capacitor (16WV 2200μ F)	[C1]	○
16	VCEAGU1HW106M	AB		C	Capacitor (50WV 10μ F)	[C2,3]	○
17	VCKYTV1EF104Z	AA		C	Capacitor (25WV 0.10μ F)	[C7]	○
18	VCCCTV1HH331J	AA		C	Capacitor (50WV 330pF)	[C4-6]	○